

REMARKS**1. Present Status of the Application**

Upon this response, claims 94-129 and 131-135 remain pending in the present application. More specifically, claims 94-129 and 131 are currently amended; claims 132-135 are newly added; claim 130 is canceled. It is believed that the foregoing amendments add no new matter to the present application.

2. Response To Objections/Rejections

Applicants respectfully traverse the rejections for at least the reasons set forth below.

Response To Point 4 of Examiner's opinions

Applicants respectfully traverse the examiner's statement that the specification fails to disclose a topmost oxide or nitride layer.

The specification discloses "The passivation layer comprises a nitride layer and an oxide layer" ~ *see paragraph [0071]* ~ The specification further discloses all of the insulating layers over the passivation layer is polymer, which is not nitride or oxide. ~ *see paragraphs [0049] and [0055]* ~ According to the above-mentioned disclosure, the specification indeed discloses the concept that a passivation layer comprises a topmost nitride layer or a topmost oxide layer.

Response To Point 7 of Examiner's opinions

Applicants respectfully traverse the examiner's statement that the "electroplated copper" or "electroplated metal" is deemed as a process limitation.

Applicants consider that “electroplated copper” or “electroplated metal” is a structure limitation because electroplated copper or metal is a specific structure that can be identified by using bulk TEM X-ray diffraction to obtain a lattice-orientation result and then comparing the result with a lattice-orientation database.

The structure implied by the process steps should be considered when assessing the patentability of product-by-process claims over the prior art, especially where the product can only be defined by the process steps by which the product is made, or where the manufacturing process steps would be expected to impart distinctive structural characteristics to the final product. See, e.g., *In re Garnero*, 412 F.2d 276, 279, 162 USPQ 221, 223 (CCPA 1979) (holding “interbonded by interfusion” to limit structure of the claimed composite and noting that terms such as “welded,” “intermixed,” “ground in place,” “press fitted,” and “etched” are capable of construction as structural limitations.) ~ *Extracted from MPEP 2113* ~

Response To Claim 94-105

As amended, independent claim 94 is recited below:

94. An electronic component comprising:
a semiconductor substrate having multiple semiconductor devices;
an interconnecting metallization structure over said semiconductor substrate;
an insulating layer over said interconnecting metallization structure; and
an upper metallization structure over said insulating layer, wherein said upper metallization structure comprises a metal layer having a thickness of between 2 and 100 μm , and wherein said upper metallization structure connects multiple portions of said interconnecting metallization structure.

Applicants respectfully assert that the electronic component patentably distinguishes over the citations by Wollesen (US5,659,201), by Chen (US6,001,538), and by Sebesta (US6,900,545).

Wollesen (US5,659,201) teaches an upper metallization structure 71/73 over an insulating layer 23/24 and the upper metallization structure 71/73 connects multiple portions of an interconnecting metallization structure 20. However, Wollesen fails to teach, hint or suggest that the upper metallization structure 71/73 comprises a metal layer having a thickness of between 2 and 100 μm .

In the latest office action, Examiner considers the feature that “the upper metallization structure comprises a metal layer having a thickness of between 2 and 100 μm ” would have been obvious to one of ordinary skill in art to use or combine in the range as claimed, because it has been held that where the general conditions of the claims are disclosed in the prior art, it is not inventive to discover the optimum or workable range by routine experimentation. Furthermore, the thickness of bonding pad in the range of 2 and 100 μm are typical as disclosed by Chen (US6,001,538) in column 3 line 53-55 or Sebesta (US6,900,545) in abstract. ~ See lines 5-13, page 6 ~

However, applicants do not agree with Examiner’s opinion. Chen (US6,001,538) teaches a bonding pad 16 over a silicon wafer 10 is typically about 100 microns by 100 microns in size but fails to teach the thickness of the bonding pad 16. ~ See Fig. 1 and lines 54-58, col. 3 ~ Furthermore, Chen fails to teach the bonding pad 16 can be used to connect multiple portions of an underlying metallization structure. Applicants do not think that the feature that “an upper metallization structure connecting multiple portions of an underlying interconnecting metallization structure comprises a metal layer with a thickness of between 2 and 100 μm ” can be easily thought up because those skilled in the art should think that “bonding pad” is used to be connected to an external circuitry but should not think “bonding pad” is used to connect multiple portions of an underlying interconnecting metallization structure.

Sebesta (US6,900,545) fails to teach that a bonding pad having a thickness of between 3 and 50 microns, recited in the abstract, can connect multiple portions of an underlying metallization structure. Applicants do not think that the feature that “an upper metallization structure connecting multiple portions of an underlying interconnecting metallization structure comprises a metal layer with a thickness of between 2 and 100 μm ” can be easily thought up because those skilled in the art should think that “bonding pad” is used to be connected to an external circuitry but should not think “bonding pad” is used to connect multiple portions of an underlying interconnecting metallization structure.

For at least the foregoing reasons, applicants respectfully submit independent claim 94 patently defines over the prior art references, and should be allowed. For at least the same reasons, dependent claims 95-105 patently define over the prior art as well.

Response To Claim 106-119

As amended, independent claim 106 is recited below:

106. An electronic component comprising:
a semiconductor substrate having multiple semiconductor devices;
an interconnecting metallization structure over said semiconductor substrate and comprising a first contact pad;
an insulating layer over said interconnecting metallization structure, wherein said first contact pad is exposed by an opening in said insulating layer; and
an upper metallization structure over said insulating layer and comprising a gold layer with a thickness of between 2 and 100 μm , wherein said upper metallization structure comprises a second contact pad connected to said first contact pad, and wherein the positions of said first and second contact pads from a top view are different.

Applicants respectfully assert that the electronic component patentably distinguishes over the citations by Wollesen (US5,659,201), by Chen (US6,001,538), and by Sebesta (US6,900,545).

Wollesen (US5,659,201) teaches an upper metallization structure 71/73 over an insulating layer 23/24 and the upper metallization structure 71/73 comprises a gold layer 71. However, Wollesen fails to teach, hint or suggest that the gold layer has a thickness of between 2 and 100 μm , and that the upper metallization structure 71/73 comprises a second contact pad connected to a first contact pad 20 exposed by an opening in the insulating layer 23/24, and wherein the positions of the first contact pad 20 and the second contact pad from a top view are different.

In the latest office action, Examiner considers that the second contact pad can be deemed as the left portion of the upper metallization structure 71/73. ~ See line 5, page 7 ~ However, applicants do not agree with the Examiner's opinion. Wollesen teaches that the upper metallization structure 71/73 is used to connect multiple portions of an underlying patterned metal layer but fails to teach, hint or suggest that the upper metallization structure 71/73 may comprise a contact pad used to be connected to an external circuitry. Therefore, the second contact pad can not be deemed as the left portion of the upper metallization structure 71/73.

In the latest office action, Examiner considers the feature that "the upper metallization structure comprises a gold layer with a thickness of between 2 and 100 μm " would have been obvious to one of ordinary skill in art to use or combine in the range as claimed, because it has been held that where the general conditions of the claims are disclosed in the prior art, it is not inventive to discover the optimum or workable range by routine experimentation. Furthermore, the thickness of bonding pad in the range of 2 and 100 μm are typical as disclosed by Chen (US6,001,538) in column 3 line 53-55 or Sebesta (US6,900,545) in abstract. ~ See lines 10-18, page 7 ~

However, applicants do not agree with Examiner's opinion. Chen (US6,001,538) teaches a bonding pad 16 over a silicon wafer 10 is aluminum alloy and typically about 100 microns by 100 microns in size but fails to teach the thickness of the bonding pad 16. ~ *See Fig. 1 and lines 54-58, col. 3* ~ Applicants do not think that the feature that "an upper metallization structure comprises a gold layer with a thickness of between 2 and 100 μm " can be easily thought up because this kind of metallization is not taught by Chen.

Sebesta (US6,900,545) teaches a bonding pad comprises a gold layer 42 that can be at least about 0.5 microns thick but fails to teach the gold layer 42 is so thick, up to 2-100 microns thick. ~ *See Fig. 5 and lines 14 and 22-24, col. 6* ~ Applicants do not think that the feature that "an upper metallization structure comprises a gold layer with a thickness of between 2 and 100 μm " can be easily thought up because this kind of metallization is not taught by Sebesta.

For at least the foregoing reasons, applicants respectfully submit independent claim 106 patently defines over the prior art references, and should be allowed. For at least the same reasons, dependent claims 107-119 patently define over the prior art as well.

Response To Claim 120-129 and 131

As amended, independent claim 120 is recited below:

120. An electronic component comprising:
a semiconductor substrate having multiple semiconductor devices;
an interconnecting metallization structure over said semiconductor substrate and comprising a contact point;
a passivation layer over said interconnecting metallization structure, wherein said contact point is exposed by an opening in said passivation layer; and
a contact pad connected to said contact point, wherein said contact pad comprises a gold layer with a thickness of between 2 and 100 μm and is used to be wirebonded thereto.

Applicants respectfully assert that the electronic component patentably distinguishes over the citations by Wollesen (US5,659,201), by Chen (US6,001,538), and by Sebesta (US6,900,545).

Wollesen (US5,659,201) fails to teach, hint or suggest that a contact pad used to be wirebonded thereto may comprise a gold layer with a thickness of between 2 and 100 μm .

In the latest office action, Examiner considers that a contact pad used to be wirebonded thereto would have been obvious to one of ordinary skill in the art to use wire teaching of Wollesen as claimed, because it would have allowed the external electrical connection. ~ *See lines 13-19, page 10* ~

However, applicants do not agree with the Examiner's opinion. Wollesen teaches a wirebond 15 or 62 is bonded onto a contact pad 10 or 20 made of aluminum, not gold, and fails to teach, hint or suggest the thickness of the contact pad 10 or 20. ~ *See Figs. 1, 2 and 6, lines 63-67, col. 1 and lines 50-57, col. 6* ~ Applicants consider that the claim should be allowed because the claimed contact pad used to be wirebonded thereto has never been taught, wherein the claimed contact pad comprises a gold layer with a thickness of between 2 and 100 μm .

In the latest office action, Examiner considers the feature that "a contact pad comprises a gold layer with a thickness of between 2 and 100 μm " would have been obvious to one of ordinary skill in art to use or combine in the range as claimed, because it has been held that where the general conditions of the claims are disclosed in the prior art, it is not inventive to discover the optimum or workable range by routine experimentation. Furthermore, the thickness of bonding pad in the range of 2 and 100 μm are typical as disclosed by Chen (US6,001,538) in column 3 line 53-55 or Sebesta (US6,900,545) in abstract. ~ *See lines 4-12, page 10* ~

However, applicants do not agree with Examiner's opinion. Chen (US6,001,538) teaches a bonding pad 16 over a silicon wafer 10 is aluminum alloy and typically about 100 microns by 100 microns in size but fails to teach the thickness of the bonding pad 16. ~ *See Fig. 1 and lines 54-58, col. 3* ~ Applicants do not think that the feature that "a contact pad comprises a gold layer with a thickness of between 2 and 100 μm " can be easily thought up because this kind of metallization is not taught by Chen.

Sebesta (US6,900,545) teaches a bonding pad comprises a gold layer 42 that can be at least about 0.5 microns thick but fails to teach the gold layer 42 is so thick, up to 2-100 microns thick. ~ *See Fig. 5 and lines 14 and 22-24, col. 6* ~ Applicants do not think that the feature that "a contact pad comprises a gold layer with a thickness of between 2 and 100 μm " can be easily thought up because this kind of metallization is not taught by Sebesta.

For at least the foregoing reasons, applicants respectfully submit independent claim 120 patently defines over the prior art references, and should be allowed. For at least the same reasons, dependent claims 121-129 and 131 patently define over the prior art as well.

Response To Claim 132-135

As amended, independent claim 132 is recited below:

132. An electronic component comprising:
a substrate; and
a contact pad over said substrate, wherein said contact pad comprises a gold layer with a thickness of between 2 and 100 μm and is used to be wirebonded thereto.

Applicants respectfully assert that the electronic component patentably distinguishes over the citations by Wollesen (US5,659,201), by Chen (US6,001,538), and by Sebesta (US6,900,545).

Wollesen (US5,659,201) fails to teach, hint or suggest that a contact pad used to be wirebonded thereto may comprise a gold layer with a thickness of between 2 and 100 μm .

Wollesen teaches a wirebond 15 or 62 is bonded onto a contact pad 10 or 20 made of aluminum, not gold, and fails to teach, hint or suggest the thickness of the contact pad 10 or 20. ~ See Figs. 1, 2 and 6, lines 63-67, col. 1 and lines 50-57, col. 6 ~ Applicants consider that the claim should be allowed because the claimed contact pad used to be wirebonded thereto has never been taught, wherein the claimed contact pad comprises a gold layer with a thickness of between 2 and 100 μm .

Chen (US6,001,538) teaches a bonding pad 16 over a silicon wafer 10 is aluminum alloy and typically about 100 microns by 100 microns in size but fails to teach the thickness of the bonding pad 16. ~ See Fig. 1 and lines 54-58, col. 3 ~ Applicants do not think that the feature that “a contact pad comprises a gold layer with a thickness of between 2 and 100 μm ” can be easily thought up because this kind of metallization is not taught by Chen.

Sebesta (US6,900,545) teaches a bonding pad comprises a gold layer 42 that can be at least about 0.5 microns thick, but fails to teach the gold layer 42 is so thick, up to 2-100 microns thick. ~ See Fig. 5 and lines 14 and 22-24, col. 6 ~ Applicants do not think that the feature that “a contact pad comprises a gold layer with a thickness of between 2 and 100 μm ” can be easily thought up because this kind of metallization is not taught by Sebesta.

For at least the foregoing reasons, applicants respectfully submit independent claim 132 patently defines over the prior art references, and should be allowed. For at least the same reasons, dependent claims 133-135 patently define over the prior art as well.

3. Conclusion

All Claims are believed to be in condition for Allowance, and that is so requested.

It is requested that should Examiner Le not find that the Claims are now Allowable that the Examiner call the undersigned at 845-452-5863 to overcome any problems preventing allowance.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'SBA', with a long horizontal flourish extending to the right.

Stephen B. Ackerman, Reg. No. 37,761